

ABSTRACT

STRUCTURAL STYLE AND HALOKINETIC SEQUENCES

ASSOCIATED WITH THE LA POPA SALT WELD,

LA POPA BASIN, NUEVO LEON, MEXICO

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An exhumed near-vertical salt weld in the Cretaceous–Eocene La Popa basin of northeastern Mexico provides a rare opportunity for documenting the detailed structural and stratigraphic attributes of welds. The La Popa weld is a 25 km long arcuate structure formerly interpreted as a reverse fault and has a fault-like displacement surface with the greatest stratigraphic and structural displacement occurring halfway along the trace of the structure. The NW end of the structure merges gradually with the La Popa salt wall and the SE end diverges into a horsetail splay of small displacement right-lateral strike-slip surfaces. Maximum stratigraphic

displacement across the weld juxtaposes Lower Cretaceous (Albian) carbonate strata against Lower Eocene siliciclastic strata. Previous estimates for maximum structural throw are approximately 6 km based on regional stratigraphic thicknesses; however, two-thirds less offset (2.5 km) was determined utilizing halokinetic sequence stratigraphy of strata adjacent to the weld. The presence of halokinetic sequences and diapir-derived detritus in all stratigraphic units adjacent to the weld indicates that the weld was formerly occupied by the SE continuation of the La Popa salt wall.

Progressive welding of the SE end of La Popa salt wall is indicated by substantial variation in the size of time-equivalent carbonate buildups at either end of the salt wall during the Late Cretaceous, which roughly coincides with initiation of Hidalgoan shortening across the basin. The Hidalgoan shortening direction trended NE-SW, which is slightly oblique to the trend of the SE end of the structure and may explain why welding preferentially occurred there. In contrast, the NW end of the system continued as a salt wall with increased halokinetic rise rates progressing through the Eocene.